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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

GARBER, CHARLES D

ART UNIT PAPER NUMBER

2856

DATE MAILED: 03/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/072,020

Applicant(s)

HENRY ET AL.

Examiner

Charles D. Garber

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12/18/2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 6 and 8-15 is/are rejected.
- 7) ☒ Claim(s) 4, 7, 16 and 17 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 1-3, 5, 6, 8-12, 14, 15 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 5, 6, 9, 12, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dickey et al. (US Patent 5,821,405) in view of Sunshine (US Patent 6,658,915).

Regarding claim 1, Dickey discloses a modular water quality apparatus and method including a "wide variety of sensors capable of measuring various water quality parameters" which is equivalent to a sensor head apparatus employable with a multi -

parameter monitoring tool assembly. The apparatus includes a sealed or unsealed housing with a cap 12 or sensor head body configured with a plurality of mechanical sensor connections 14 or ports, where each of the plurality of connections is configured to engage and interconnect with sensors 16 or sensor head components. The sensors may be interchanged with updated or different sensors (column 3 line 61 to column 4 line 10). As shown in figure 1 each of the plurality of connections 14 or ports appears sized to receive a sealed connector end 36 of the sensor 16. Engagement and disengagement of the sensor 16 within the plurality connections 14 occurs through application of a linear motion (depicted by arrows) upon the sensor. Linear force would inherently be required to effect the linear motion depicted.

However, Dickey does not expressly teach the sensors engage and disengage only through linear motion.

Sunshine teaches sensors 150 shown in figures 2A and 9A which are releasably plugged into a receptacle only through linear motion (abstract).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide sensors which are releasably installed with only linear motion so that it may be swapped as necessary to increase the device flexibility at low cost (column 2 lines 57-64).

Regarding claims 5, Dickey further discloses an interchangeable sensor head component comprising at least a sensor though not an accessory (which is defined in the specification as mechanical or electro mechanical components configured for performing a particular task).

As for claim 6, the interchangeable sensors must be either one of active and passive sensors which are defined by the specification as sensor that either have internal power or not. The Dickey sensors must be one of these types as there are logically no other alternatives.

As for claim 9, the sealed housing (no reference number and not shown) discussed above with respect to claim 1 which is attached to the cap 12 (column 3 lines 20-26) is equivalent to an engagement means employable for connecting the sensor head body to at least one other component as in the instant invention.

As for claim 12, figure 1 shown the cap 12 or sensor head body further includes a motherboard 20 or circuit board device attached to it. The motherboard 20 or circuit board device is shown with a plurality of rectangular connection areas for connecting each of a plurality of interchangeable daughterboards 22 which interface with the sensors 16 by sensor connections 18 or 38 (column 4 line 65 to column 5 line 18). The rectangular attachment areas are considered to be equivalent to a plurality of electrical interconnection plugs mounted thereon for providing the interconnection with the interchangeable sensor head components.

As for claim 14, the individual rectangular areas discussed above with respect to claim 12 are considered equivalent to a modular plug-in connection device for electrically connecting with the daughterboards 22 or other circuit card device. Each daughterboard is a separate module.

Claim 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dickey et al. (US Patent 5,821,405) as modified by Sunshine et al. (US Patent

6,658,915) and applied to claim 1 above further in view of Palfenier et al. (US Patent 6,359,430).

Regarding claim 2, Dickey as modified above discloses all the limitations as in the instant invention as well as further disclosing the plurality of connections 14 are each configured to receive and engage a sealed connector 36 of the sensor 16 which is shown in the figures to be an insertable portion of the sensor.

The references however do not expressly teach the sealing is accomplished with a radially compressible sealing device disposed around the insertable portion.

Palfenier discloses a sensing structure 116 with an end disposed within a sensor housing 102 (see figure 1). Palfenier teaches that "in a preferred embodiment, the connector housing is formed with at least one o-ring groove and an o-ring is disposed within the o-ring groove such that it establishes a seal between the sensor housing and the connector housing." The o-ring shown in the figure disposed between sensor body and sensor housing to effect the seal. A seal is effected by an o-ring by compression.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to dispose an o-ring between the end of a sensor and a sensor housing in order to establish a seal and prevent contaminants causing damage to sensitive components.

As for claim 3, Dickey discloses a plurality of connections 14 or ports which are at least first cylindrical portions as shown in the figures. The connections or ports with cylindrical portion is shown exiting through an external surface of the sensor head and includes a first diameter sized to accommodate the connector 36. Dickey however does

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not expressly disclose a second portion configured to begin a distance below the external surface and includes a second diameter larger than the first diameter, the plurality of ports being further configured such that upon insertion of the insertable portion through the first portion to the second portion, the radially compressive sealing device is configured to expand into the second portion creating a compressive force which resists withdrawal of the sensor component from the port. In other words, Dickey does not expressly teach a flat bottomed O-ring groove within the sensor port.

Upon close examination of figure 1, Palfenier further shows the outer diameter of the o-ring 138 with a wider diameter than the invisible line defining the inner bore of the housing 106. That is, the inner bore seems to inherently show an indentation to accommodate the wider o-ring. Palfenier though does explicitly provide a cylindrical groove for the o-ring on the sensor side so Examiner considers the apparent slight indentation on the housing side to merely be an artifact of an imprecise illustration.

However, Examiner considers the location of an o-ring groove on either the outer or inner surface of a mating male and female connection to be a substantially equivalent to a rearrangement of parts. It would have been obvious to one having ordinary skill in the art at the time the invention was made to locate the o-ring groove on either the outer or inner surface of the sensor or housing respectively, since it has been held that rearranging parts of an invention involves only routine skill in the art. In re Japikse, 86 USPQ 70.

Claims 8, 10, 11, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dickey et al. (US Patent 5,821,405) as modified by Sunshine et al. (US Patent

6,658,915) and applied to claim 5, 9, 1 above and further in view of DataSonde 4a/Brochure entitled New Series 4a Water Quality Instruments from Hydrolab (henceforth "Hydrolab Brochure")

Regarding claim 8, the Dickey reference as discussed above with respect to claim 5 does not expressly teach an interchangeable sensor head component comprising at least an accessory (which is defined in the specification as mechanical or electro mechanical components configured for performing a particular task) which is at least one of a wiper device, a shutter device and a stirring device.

The Hydrolab Brochure discloses a similar multi-sensor, multi-parameter water quality sensing device teaching a shuttered turbidity sensor which is an electromechanical device or an accessory as defined in the Applicant's disclosure.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include a shuttered turbidity sensor as there is no need to wipe the optical surfaces.

As for claim 10 and 11, the Hydrolab Brochure teaches the end cap engaging first a housing but also a guard or restrictor. The portion of the cap engaging the housing includes a radially compressive sealing device (not shown but known to the Examiner from personally disassembling one such device) extending around a portion of the cap or sensor head positionable for engaging a portion of the housing as in the instant invention. The housing is environmentally sealable and encloses sensitive electronic components

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include a housing engaging the cap with an o-ring around the cap in order to protect the electronics within from contacting water.

As for claim 15, Dickey lacks the cap or sensor head body further configured to attach to an enclosure device, wherein the enclosure device comprises at least one of: a restrictor, calibration container, and a flow cell.

The Hydrolab Brochure teaches a guard or restrictor attached to the end cap (the end cap is the portion holding probes or sensors) as shown in the photos.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to attach a restrictor to a sensor cap in order to allow water to flow amongst the water sensors while protecting the sensor from impact and damage from any obstacles the device may encounter in the water or while on land.

Allowable Subject Matter

Claims 4, 7, 13, 16 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Please see earlier Office Action for reasons for indicating allowable material.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Lagace et al. (US Patent 5,186,050) and Sargent (US Patent 6,490,939) teach other prior art linear engageable and disengageable sensors.

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Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles D. Garber whose telephone number is (571) 272-2194. The examiner can normally be reached on 6:30 a.m. to 3:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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